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## (54) CONTAINER CLOSURE

BEHÄLTERVERSCHLUSS

DISPOSITIF DE FERMETURE POUR RECIPIENT

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**Description**

[0001] The present invention concerns an arrangement for closing a container for liquids, and in particular relates to an arrangement suitable for use with a child's drinking cup.

[0002] Drinking cups are often provided for young children in which the cup is covered and sealed by a lid including a spout or mouthpiece through which a liquid from a container may be drunk. The spout facilitates the use of the cup by very young children, and also the lid helps to prevent accidental splashing or spillage of the drink. However, as the spout remains open such a cup cannot be considered as leakproof, and this is a considerable drawback in situation where the cup is likely to be knocked over accidentally or, for example, when travelling when there would ideally be provided a completely closeable and leakproof container within which a beverage may be transported, subsequently serving as a cup from which a child may drink the contents.

[0003] US-A-5079013 seeks to mitigate and/or obviate such problems, but uses a mechanical valve arrangement where liquid flows over the components and thus could be susceptible to contamination by deterioration of the material of the components. The mechanical components are also susceptible to normal wear and tear, and deterioration of any of the materials which could lead to break-up of the materials, could lead to serious problems.

[0004] According to the invention there is provided a closure assembly for a container for liquids, the assembly comprising a closure member adapted to be releasably mounted on the container, a through passage in the closure member for passage of liquid from the container to an outlet, and normally closed valve means which is associated with the through passage, characterised in that the valve means comprises a valve member formed of a resiliently deformable material and defining an internal space which is in communication with externally of the closure member, the valve member having a valve face which, in a non-deformed condition of the valve member is biased to locate across the outlet to prevent flow of liquid therethrough, the valve member being deformed by a reduction of pressure in the internal space due to the application of negative pressure to the closure member, whereby the valve face is moved away from the outlet to enable flow of liquid therethrough.

[0005] A mounting for the valve means may be releasably fitted in the closure member and may have a similar overall size to that of the closure member for safety purposes. A pair of valve members may be provided, each associated with a respective outlet, and the valve members may be formed of silicone.

[0006] The closure member may take the form of a mouthpiece on a closure lid for a drinking vessel, whereby negative pressure can be applied by sucking the mouthpiece.

[0007] According to the invention there is further provided a drinking vessel having a closure assembly as defined in any of the three preceding paragraphs.

[0008] The invention will be further described for the purposes of illustration only with reference to the accompanying drawings in which:-

Fig. 1 is a perspective view of a drinking cup incorporating the invention; and

Fig. 2 is a cross-section on an enlarged scale of a valve arrangement of the cup of Fig. 1.

[0009] Referring to Fig. 1, a child's drinking cup 10 comprises an open-topped container part 12 and a lid 14, each of which may conveniently be moulded from a rigid plastics material. The lid 14 may be screwed or snap-fitted on the container 12 to provide a liquid-tight seal. A spout 16 is provided to project from the periphery of an upper surface of the lid 14. The spout 16 is upwardly tapered and of convenient dimensions to permit it to act as a mouthpiece through which a child may take a beverage contained within the cup 10. In the present example, the spout 16 is integrally moulded with the lid 14.

[0010] As is best shown in Fig. 2, the spout 16 is provided with a tubular extension 17 defining a central internal channel 18 having a mouth 20 opening at the free end of the spout 16.

[0011] Two further openings 24 are provided in the spout 16, one each side of the mouth 20.

[0012] A valve assembly is mounted within the spout 16 and comprises a closure plate 19 which, at its respective side edges, interfits with internal shoulders 21 of the spout 16 to define a space 26 communicating with openings 20 and 24. The closure plate 19 has a central recessed part 19A, overlying which is a flange 22, thereby defining a cavity 26A, the flange having a central aperture by which to locate over the free end of the tubular extension 17. A pair of through apertures 23 are provided in the flange at respective sides of the central aperture and therefore, in use, on respective sides of the tubular extension 17, each aperture 23 having on the side thereof remote from the central cavity 26A, an upstanding boss defining a peripheral lip 23A. When fitted to the spout 16, the closure plate 19 defines the space 26 above the flange 22 bounded at the sides by the wall of the spout and the wall of the tubular extension, the space 26 communicating both with the respective mouth 24 and with the central cavity 26A, the latter communication being through the respective aperture in the flange 22.

[0013] The valve assembly further includes a pair of valve members 27 each having the form generally of a flexible bellows, preferably formed of silicone. Each valve member 27 is open at one end to locate over the respective peripheral lip 23A on the flange 22 of the closure plate 19, and at its other end is closed by a valve face 28 which can locate on a valve seat 30 of the

respective mouth 24 to close communication between the latter and the internal space 26. Each valve member 27 is biased to an extended position in which the valve face 28 sealingly seats on the mouth 24. The internal space of each valve member 27 is therefore in communication with the internal channel 18 but is closed relative to the internal space 26 of the spout 16, which is in communication through suitable apertures (not shown) with the interior of the container 12.

[0014] In normal circumstances, liquid flows from the body of the cup 10 into the space 26, but is prevented from exiting through either mouth 24 by the respective valve face 28. When it is required to drink liquid from the container 12, the spout 16 is placed into the child's mouth and sucked, thereby causing air to be drawn from the channel 18 and the cavity 26A. This causes the bellows of each valve member to collapse so that each valve face 28 is pulled in the downward direction as shown in Fig. 2 and away from the respective valve seat 30, thereby allowing liquid to be sucked into the space 26 from the interior of the container 12, and therefrom into the mouth 24 and out of the spout 16. On release of the sucking action, recovery of the bellows returns each valve member 27 to the closed position.

[0015] There is thus shown an arrangement which is simple to manufacture and use and which provides a reliable seal to the drinking vessel except when it is positively opened by the action of a child drinking.

[0016] The valve assembly may be removably mounted in the spout for cleaning purposes, although the removable mounting would require to be tamper-proof. The valve assembly may be locatable in the spout as described and shown or may alternatively take the whole size of the lid, as the increased size would make it impossible for the valve assembly, if for any reason it did become detached from the lid, to be placed into a child's mouth.

[0017] Modifications may be made within the scope of the invention. In an alternative embodiment (not shown) a separate valve arrangement may be provided for insertion into an appropriate spout 16. The arrangement and configuration of the valve may be different from that described and shown. The cup 10 may be made of any convenient material or materials bearing in mind particular requirements, for example as regards the ability to sterilise the cup, or place it within a dishwasher or microwave oven. The container 10, although described with reference to a child's cup, may also find use for invalids and the elderly.

#### Claims

1. A closure assembly for a container for liquids, the assembly comprising a closure member (14) adapted to be releasably mounted on the container (10), a through passage (24) in the closure member (14) for passage of liquid from the container (10) to an outlet (24), and normally closed valve means

(27, 28) which is associated with the through passage (24), characterised in that the valve means comprises a valve member (27) formed of a resiliently deformable material and defining an internal space, which is in communication with externally of the closure member (14), the valve member (27) having a valve face (28) which, in a non-deformed condition of the valve member (27) is biased to locate across the outlet (24) to prevent flow of liquid therethrough, the valve member (27) being deformed by a reduction of pressure in the internal space due to the application of negative pressure to the closure member, whereby the valve face is moved away from the outlet (24) to enable flow of liquid therethrough.

2. An assembly according to Claim 1, characterised in that a mounting for the valve means (27, 28) is releasably fitted in the closure member.
3. An assembly according to Claim 1 or 2, characterised in that a valve assembly including the valve means (27, 28) has a similar overall size to that of the closure member (14).
4. An assembly according to any of the preceding Claims, characterised in that the closure member has the form of a mouthpiece on a closure lid for a drinking vessel, whereby negative pressure can be applied by sucking the mouthpiece.
5. An assembly according to any of the preceding Claims 3, characterised in that the valve member (27) is formed of silicone.
6. An assembly according to any of the preceding Claims, characterised in that a pair of valve members (27) is provided, each associated with a respective outlet (24).
7. An assembly according to any of the preceding Claims, characterised in that the closure member (14) has means defining a channel (18) which opens at one end (20) externally of the closure member and at the other end is in communication with the valve means (27, 28), whereby the application of the negative pressure may take place through the channel (18).
8. A drinking vessel characterised by a closure assembly according to any of the preceding Claims.

#### Patentansprüche

55. 1. Verschlußanordnung für einen Behälter für Flüssigkeiten, wobei die Anordnung aufweist: ein Verschlußglied (14), das ausgelegt ist, um an dem Behälter (10) lösbar montiert zu werden; einen

Durchlaß (24) in dem Verschlußglied (14) für den Durchtritt von Flüssigkeit von dem Behälter (10) zu einem Auslaß (24); und ein normalerweise geschlossenes Ventilmittel (27, 28), das dem Durchlaß (24) zugeordnet ist, dadurch gekennzeichnet, daß das Ventilmittel ein aus einem elastisch verformbaren Material gebildetes Ventilglied (27) aufweist, das einen inneren Raum bestimmt, der mit dem Raum außerhalb des Verschlußglieds (14) in Verbindung steht, wobei das Ventilglied (27) eine Ventilfläche (28) hat, die in einem nicht-verformten Zustand des Ventilglieds (27) vorgespannt ist, um quer über den Auslaß (24) anzuliegen, um einen Flüssigkeitsfluß durch ihn zu verhindern, und wobei das Ventilglied (27) durch eine Druckverringerung in dem inneren Raum aufgrund des Anlegens eines negativen Drucks an das Verschlußglied verformt wird, wodurch die Ventilfläche von dem Auslaß (24) weg bewegt wird, um den Flüssigkeitsfluß durch ihn zu ermöglichen.

2. Anordnung nach Anspruch 1, dadurch gekennzeichnet, daß eine Befestigung für das Ventilmittel (27, 28) in dem Verschlußglied lösbar befestigt ist.
3. Anordnung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß eine das Ventilmittel (27, 28) beinhaltende Ventilanordnung eine ähnliche Gesamtgröße wie das Verschlußglied (14) hat.
4. Anordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Verschlußglied die Form eines Mundstücks auf einem Verschlußdeckel für ein Trinkgefäß hat, wodurch ein negativer Druck durch Saugen an dem Mundstück angelegt werden kann.
5. Anordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Ventilglied (27) aus Silikon geformt ist.
6. Anordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß ein Paar Ventilglieder (27) vorhanden ist, von denen jedes einem betreffenden Auslaß (24) zugeordnet ist.
7. Anordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Verschlußglied (14) ein Mittel hat, das einen Kanal (18) bestimmt, der sich an einem Ende (20) außerhalb des Verschlußglieds öffnet und an dem anderen Ende mit dem Ventilmittel (27, 28) in Verbindung steht, wodurch das Anlegen des negativen Drucks durch den Kanal (18) stattfinden kann.
8. Trinkgefäß, gekennzeichnet durch eine Verschlußanordnung nach einem der vorhergehenden Ansprüche.

## Revendications

1. Ensemble d'obturation destiné à un récipient pour liquides, l'ensemble comprenant un élément d'obturation (14) adapté à être monté, de façon amovible, sur le récipient (10), un passage (24) ménagé dans l'élément d'obturation (14) pour permettre le passage du liquide du récipient (10) vers un orifice de sortie (24), et des moyens formant clapet (27, 28), normalement fermés, qui sont associés au passage (24), caractérisé en ce que les moyens formant clapet (27) comprennent un clapet (27) constitué en matériau élastiquement déformable et définissant un espace intérieur qui communique avec l'extérieur de l'élément d'obturation (14), le clapet (27) présentant une face d'obturation (28) qui, lorsque le clapet (27) n'est pas déformé, est déplacée pour venir s'appliquer sur l'orifice de sortie (24) afin d'empêcher le liquide de s'écouler à travers celui-ci, le clapet (27) étant déformé par une baisse de pression dans l'espace intérieur, due à l'application d'une pression négative à l'élément d'obturation, la face d'obturation étant déplacée à l'opposé de l'orifice de sortie (24) pour permettre l'écoulement du liquide à travers ce dernier.
2. Ensemble selon la revendication 1, caractérisé en ce qu'un dispositif de fixation destiné aux moyens formant clapet (27, 28) est monté de façon amovible dans l'élément d'obturation.
3. Ensemble selon la revendication 1 ou 2, caractérisé en ce qu'un ensemble formant clapet comprenant les moyens formant clapet (27, 28) présente des dimensions globales similaires à celles de l'élément d'obturation (14).
4. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément d'obturation présente la forme d'un bec présent sur un couvercle d'obturation destiné à un récipient pour boissons, une pression négative pouvant être appliquée en tétant le bec.
5. Ensemble selon la revendication 3 qui précède, caractérisé en ce que le clapet (27) est constitué en silicone.
6. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce qu'est prévue une paire de clapets (27), chacun étant associé à un orifice de sortie (24) respectif.
7. Ensemble selon l'une quelconque des revendications précédentes, caractérisé en ce que l'élément d'obturation (14) comprend des moyens définissant un canal (18) qui s'ouvre à une extrémité (20), à l'extérieur de l'élément d'obturation et, à l'autre

extrémité, se trouve en communication avec les moyens formant clapet (27, 28), l'application de la pression négative pouvant être réalisée à travers le canal (18).

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8. Récipient pour boissons, caractérisé par un ensemble d'obturation selon l'une quelconque des revendications précédentes.

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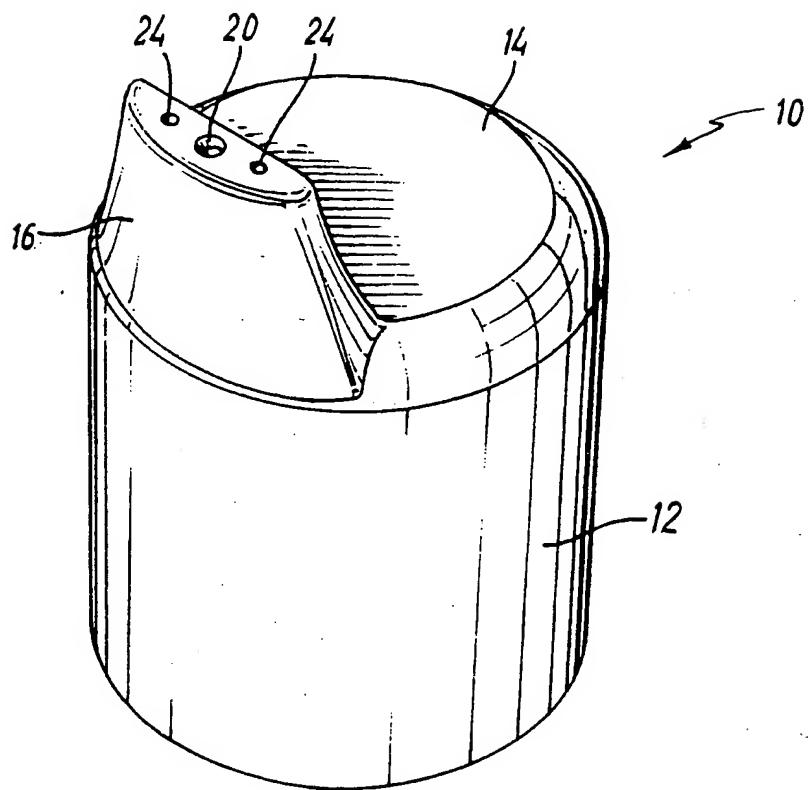


FIG. 1

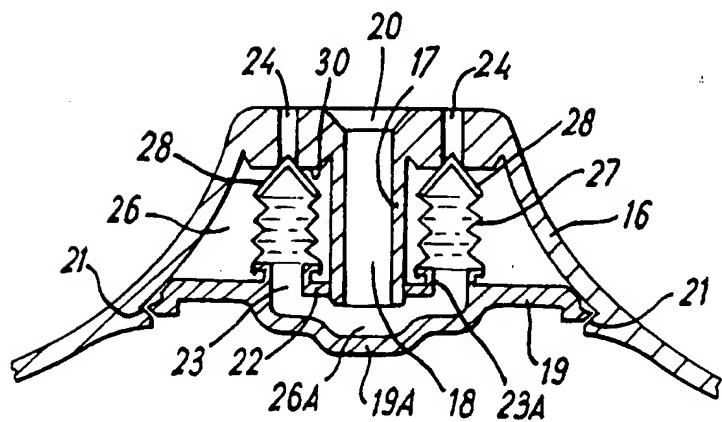


FIG. 2